



MODULE THREE: The Research Process

BACKGROUND

This module covers the research process and its major steps; how to identify good research problem and good design, the main characteristics of research objectives, some definitions and examples of research questions and hypothesis; and how to create a research strategy.

At the end of this module, it is expected that the student is able to:

- *explain the research process, its basic steps and importance of these steps;*
- *evaluate/describe a good research problem as well as that of a good design;*
- *identify the main characteristics of research objectives;*
- *formulate a research question and hypothesis; and*
- *identify potential research topics.*

1. The Research Process

Figure 1 illustrates the basic stages in the conduct of research (Naoum, 1998). Each stage is related to each other and revisited at different points throughout the research process. The major stages of the research will be highlighted and discussed in detailed in the succeeding sections.

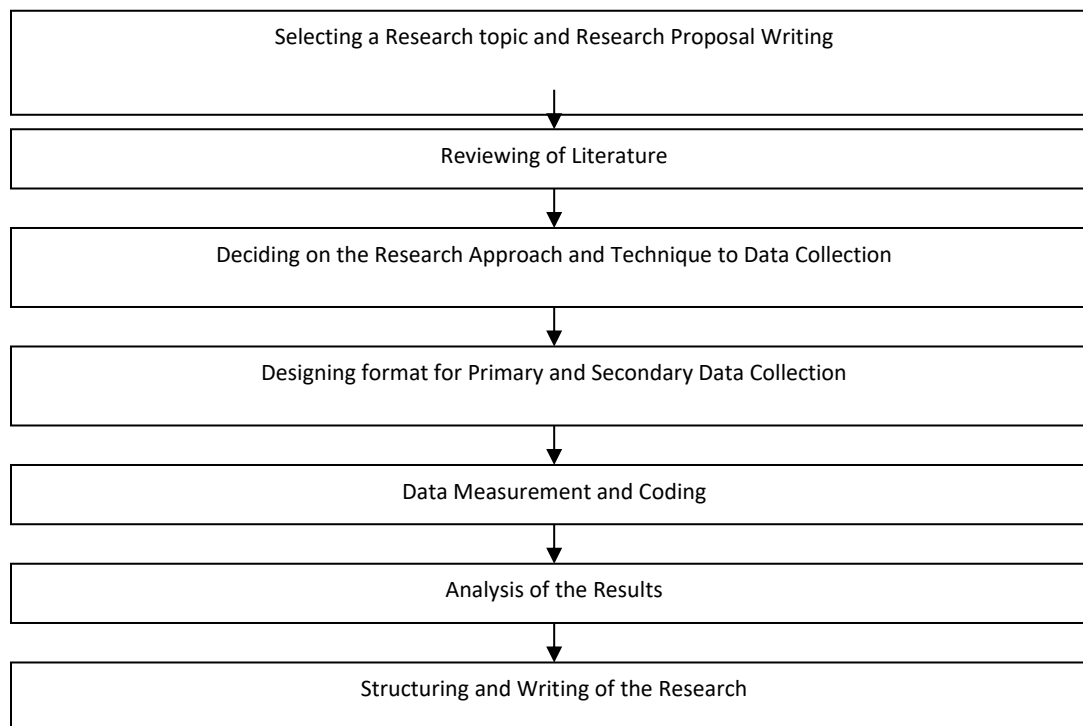


Figure 1: The Research Process

resources (time, energy and money). The statement of the research topic (or in the form of a problem to be investigated) serves as a signpost and a boundary marker in terms of the specific path and the territory to be covered in the study. Thus, the significance of a research problem rests upon its 'contribution to knowledge'.

Furthermore, the choice of a research topic is influenced by motives, purpose, interest and expertise (personal interests/goals, academic/discipline contribution or social contribution); the literature (accessibility, complexity and difficulty of the theories, models and research), relevance and restrictions (audiences/participants, politics and feasibility); facilities and resources (Blaikie, 2000; Riley et al, 2000; Depoy & Gitlin, 1998). Indeed, framing the research problem is a critical to the entire research project and influences all subsequent research processes. It requires a thorough thinking from the selection of a broad topic area to the framing of a tangible research problem (Depoy & Gitlin, 1998).

(Miller, 1991) identifies a preliminary checklist in evaluating the overall research design:

- type of underlying theory
- study design
- access to organisation and respondents
- research control over the system to be studies
- data for test of hypotheses
- type of datum
- temporal dimension
- sample (population) and number of cases to be studied
- source and method of gathering data
- number and types of variables involved
- selection of scales for measurement (data analysis)
- character of distribution of variables
- treatment/handling of data
- time/duration for study
- funding required and availability



Finally, there are also five basic sources for research topic and problem identification as identified below (Depoy & Gitlin, 1998):

- professional experience – the most and immediate source of information
- societal trends – as reflected in the policies, legislation, and funding priorities
- professional trends – as reflected in newsletters and professional publications
- published research – research studies from journals and reports
- existing theory – as puts forward a number of relationships between concepts

3. The Research Questions

The research question is the most critical part or element of any research design. The formulation of research questions is the real starting-point in the preparation of a research design – answer the three main types of questions, namely: what, why and how.

It defines the nature and scope of the research which guides the arguments and inquiry, and provokes the interests among the readers. Thus, it is not uncommon to spend more time on the researching, conceptualising and forming of each individual word of the research question than on any other part of the research design.



The process of formulating and assessing research questions is not easy to spell out. Research questions are critical because of the following reasons (Bryman, 2004):

- it guide the literature search for the study
- it guide the decisions about the kind of research design to be employed for the study
- it guide the decisions about what data to be collected/needed and from whom/where
- it guide the analysis of the data
- it guide the writing up of the data
- it stop the study from going off in unnecessary directions and tangents

In other words, research questions organise, delimit and provide a framework for both the data needed and writing up of the study. It is also often involves developing a conceptual framework for the research as well, wherein the research questions operationalise the conceptual framework by focusing and delimiting the study and giving direction to the sampling decisions that will be required (Punch, 2005).

To write strong research questions, it should have the following features (Punch, 2005; Bryman, 2004):

- evocative or suggestive
- make it timely
- frame it as a paradox
- substantially relevant
- fill in the missing gap
- make connections or interconnected and related or linked to each other
- clear and easily understood
- specific and limit the variables
- researchable and answerable
- neither too broad nor too narrow
- potential for making a contribution to knowledge

Research questions need to be clearly "doable." Writing a research question is an iterative process and need to be carefully considered in the research design and budget.

4. The Research Objectives

A research objective is particular with the type/body of knowledge to be produced which ranges from simple to complex ones, and encompasses both 'basic' and 'applied' research. Research objectives include exploration, description, explanation, understanding, prediction, change, evaluation, and impact assessment as explained further below (as quoted from Blaikie, 2000):

- to explore is to attempt to develop an initial, rough description or understanding of a phenomenon/event;
- to describe is to provide a detailed account or the precise measurement and reporting of the characteristics of some population, group or phenomenon/event, including establishing regularities;
- to explain is to establish the elements, factors or mechanisms that are responsible for producing the state of or regularities in a phenomenon/event
- to understand is to establish reasons for particular action, the occurrence and course of an event, these reasons being derived from the ones given by the respondents;
- to predict is to use some established understanding or explanation of a phenomenon to postulate certain outcomes under particular conditions;
- to change is to intervene in a situation by manipulating some aspects of it, or to assist the participants/respondents in doing so, based on established understanding or explanation; and
- to evaluate is to monitor intervention programmes to assess whether they have achieved their desired outcomes, and to assist with problem-solving and policy-making
- to assess impacts is to identify the likely consequences of planned projects, technological change or policy actions on structures, processes and or people.



5. Characteristics of a Research Problem/Research Objectives

S-specific: the problem should be specifically stated

M-easurable: it is easy by using research instruments, apparatus, or equipment

A-chievable: can be achieved using correct statistical tools to arrive at precise results

R-ealistic: real results are attained because they are gathered scientifically and not manipulated or maneuvered

T-time-bound: time frame is required in every activity because the shorter completion of the activity, the better.

In addition, a good research problem should be: (a) interesting, (b) innovative, (c) cost-effective, (d) relevant to the needs and problems of the people, (e) relevant to government thrusts, (f) measurable and time-bound.

Research Objective is defined as statement of purpose for which the investigation is to be conducted. It is a guide to be accomplished by the researcher in conducting a study. It has the same characteristics, SMART with research problem.

6. The Research Hypothesis

A simple definition of a hypothesis is that “it is a proposition to be tested or a tentative statement expressed in terms of a relationship between independent and the dependent variables” (Neuman as cited by DePoy & Gitlin, 1998; Frankfort-Nachmias & Nachmias, 1996). It is also considered as a ‘tentative’ answer to a research problem because this will be verified after it has been tested empirically (Frankfort-Nachmias & Nachmias, 1996).

A research study can be directed by one or more hypotheses, but on the other hand, there are some types of research which inappropriate to set out with hypotheses. Hypotheses are considered to be essential and stated precisely which are drawn from a variety of sources. Including research problems, hypotheses can be derived in many ways – from theories, observations, and from the professional literature (Frankfort-Nachmias & Nachmias, 1996).

The hypotheses can also be viewed to tentatively answer to ‘why’ and ‘how’ research questions (Blaikie, 2000). Further, hypotheses have some connections with the literature review, wherein in some cases it is possible to derive such an answer from existing theory or it construct a new theory. Specifically, in the ‘deductive research strategy’, the development of a theory from which hypotheses can be deduced/realised is an essential part of answering ‘why’ questions. On the other hand, in the ‘abductive’ research strategy, the hypotheses are integral part of the continuing process of data collection and analysis, observation, and testing.

The formulation of usable hypotheses is considered as a central importance. Thus, there are criteria for evaluating hypotheses’ validity which distinguish them other forms of statements (Walliman, 2006; Frankfort-Nachmias & Nachmias, 1996; Miller, 1991).

- assertions but not suggestions
- should have empirical referents
- must be specific but limited in scope
- should be related to available techniques
- should be related to current body of theory/knowledge
- expressed as economically using correct terminology
- must be conceptually clear statements about relationships between variables
- must be testable with available methods and value-free

Ultimately, a good hypothesis is a very useful aid to organising the research which somehow limits the inquiry to the interaction of certain variables (Walliman, 2006). It also suggests the appropriate methods to be used in the collection, analysis and interpretation of the data gathered. Accordingly, the confirmation and rejection of the hypotheses using empirical or experimental testing gives a clear indication of the extent of knowledge obtained. A



set of questions, propositions, or a statement of intent to investigate and evaluate critically are alternatives to hypotheses. Question or questions should be derived from the research problem which also gives a clear indication of the subject under study and the methods to be used. Proposition is a theoretical statement which also indicates clear direction and scope of the research study, allowing the study to concentrate on particular relationships between events, without having to comply with the rigorous requirements of a hypothesis. Not all research study needs to test a hypothesis or to answer a question, but instead, the subject and scope of the study are expressed in a statement of intent which also derived from the research problem.

Some other definitions about hypothesis

According to Jha (2011),

- (a) It is a scientific outlook towards the research and it leads the research to the correct direction
- (b) It helps the researcher to decide what sort of information has to be collected in relation to the problem and how to relate the information
- (c) It plays an important role in deciding the samples, tool, from where to get the data and which statistical method should be applicable
- (d) It is in predictive statement which comprises of two or more variables and these variables show relationship with each other

On the other hand, it is defined as a wide guess that is formulated and temporarily adopted to explain the observed facts covered by the study (Paler-Calmorin & Calmorin, 2007). In addition, hypothesis is important for it tells the researcher on: what to do” and “how to go about” solving a research problem or objectives. According to Frankfort-Nachmias and Nachmias (1997), a hypothesis is a tentative answer to a research problem, expressly in the form of a clearly stated relation between the independent and the dependent variables. Hypotheses are tentative answers because they can be verified only after they have been tested empirically. If it is rejected another one is put forward, otherwise it is accepted, then it is incorporated into the body of scientific knowledge. Moreover, there are four (4) common characteristics of the hypothesis: *clear, specific, testable or amenable (open) to empirical testing with the available research methods, and value-free*. In addition (Jha, 2011) identifies good hypothesis as in the *simplest form, precise, it ensures that sample is accessible and approachable, including the tools and techniques*.

Fraenkel, Wallen & Hyun (2013) defines hypothesis as simply as a “prediction of the possible outcomes of a study. It is a restatement of the research question (research problem). Examples:

Research Question: Will students who are taught history by a teacher of the same gender like the subject more than students taught by a teacher of a different gender?

Hypothesis: Students taught history by a teacher of the same sex will like the subject more than students taught history by a teacher of a different gender

*** (Note: Dependent variable – liking for history; Independent variable – gender of the teacher)*

Moreover, there are *directional hypothesis and non-directional hypothesis*. A *directional hypothesis* indicates specific direction (such as higher, lower, more or less) that a researcher expects to emerge in a relationship. Thus, it is a prediction about the specific nature of a relationship. Example: Method A is more effective than Method B. The non-directional hypothesis does not make a specific prediction about what direction the outcome of the study will take. Thus, it is a prediction that a relationship exists without specifying its exact nature. Example: There will be a difference between Method A and Method B.

There are two types of hypothesis: Null hypothesis (H_0) and Alternative hypothesis (H_1). The null hypothesis (stated in negative form) is a denial of an existence of a trait, characteristic, quality, value, correlation or difference of results

while alternative hypothesis (stated in positive form) is an affirmation of the existence of observed phenomena; and the opposite of null hypothesis.

Examples: Specific Research Problem/Question: *Is there a significant difference on the yield of peanuts planted in pots using night soil and chicken dung as fertilizers?*

Null hypothesis (H_0): There is no significant difference on the yield of peanuts planted in pots using night soil and chicken dung as fertilizers.

7. What is assumption?

It is statement that need not to be tested (Castillo, 2007). It is accepted as facts based on observations or based on the existing literature. The assumption must be stated when there is controversy on the acceptability of a theory/concept/research method or instruments which the proposed research considers acceptable (Castillo, 2002 as cited by Castillo, 2007).

According to Paler-Calmorin & Calmorin (2007), assumptions are presumed to be true statements of facts related to the research problem.

Examples:

That the teachers' ability to cope with frustrations can lead to efficiency in their assigned teaching fields.

That the teachers' coping mechanisms can lead to a closer understanding of the relationship with the students.

8. Theoretical Framework and Conceptual Framework

Theoretical Framework shapes the justification of the research problem/research objectives in order to provide the legal basis for defining its parameters. Conceptual Framework presents specific and well-defined concepts which are called constructs which are derived from abstract concepts of the theoretical framework. Both frameworks provide clear explanation regarding the relationship of variables

A typical model is the **INPUT-PROCESS (THROUGHPUT)-OUTPUT** which constitutes the flow of the activities, including the relationship of selected variables as shown in the figure below. A brief discussion for each process is required to have clearer understanding of the research methodology employed in the study.

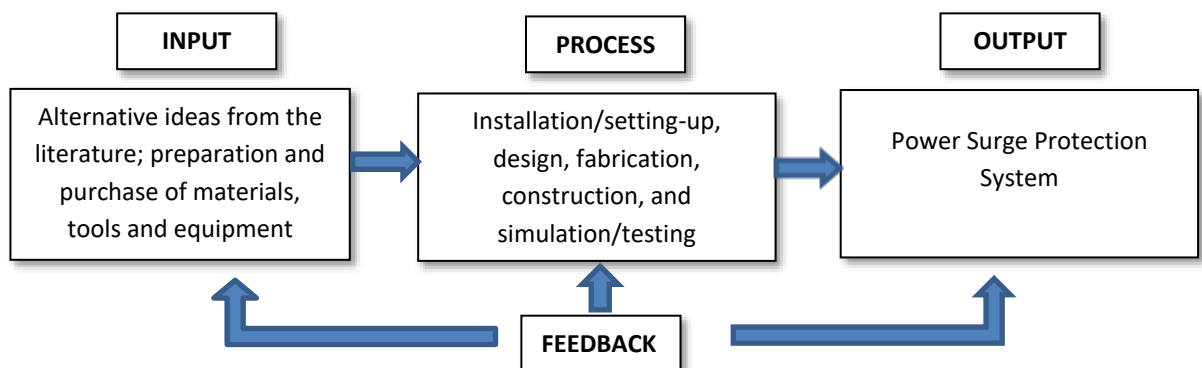


Figure 3. The Conceptual Framework – IPO



The conceptual framework can be presented using concepts, facts, variables and their relations that explain or predict how an observed phenomenon exists and operate as graphically shown below.

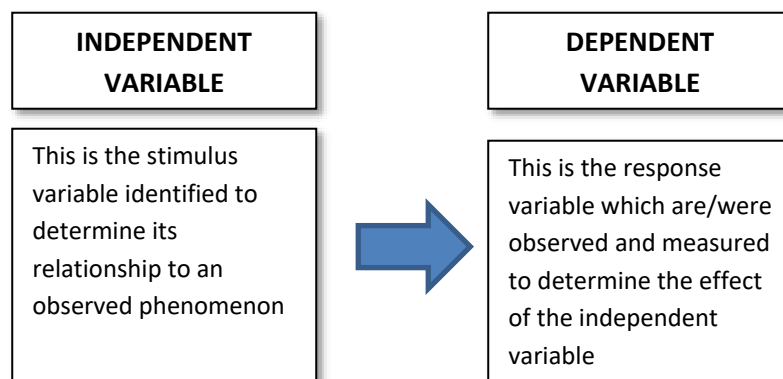


Figure 4. The Conceptual Framework – Independent and Dependent Variables

9. Designing a Research Strategy

Developing a research strategy depends on the following major issues: (a) type of study to be undertaken, (b) timetable or schedule to undertake the research study, and (c) appropriate data and information required for the study/topic.

The following questions will help determine the best and appropriate research strategy (<http://library.wustl.edu/research/design.html>):

- **What type of research topic/study are you working?** The depth of research depends on the nature of the study to be undertaken. It also depends on the guidelines specified by the institutions or individuals involved in the conduct of the study
- **How much time do you have?** For a limited time, it is recommended to limit gathering of information from books, journals, and magazines available in the library or on the web. Having more time to conduct the research, it is advisable to incorporate a variety of materials on the study and to obtain resources from other available sources.
- **What type of information do you need?** Research design and methodology to be employed in the study determine the type of resources to be needed. It also needs to consider the sources of data, either primary or secondary or both in the context of the study.



MODULE ASSESSMENT

MODULE TWO ASSESSMENT TASK #3

1. Submit three (3) proposed research topics/titles that you think potential to be developed into a capstone project.
2. Each topic/title should contains 2-3 primary research objectives to be achieved by the capstone project.
3. Provide a rationale or the research problem for each topic. What is the existing problem/issue or concern that your proposed research study intends to address? Be specific with your answer.
4. Follow the matrix/table below to reflect your answers.
5. Submit your answers thru Google Classroom on or before 23:59PM, Monday, 15 March 2021. Point deduction for late submission.
6. Short bond paper, 1.5 spacing, 10-12 font size, either MSWord or PDF file. The file name should be: **SURNAME_Assessment#2**. Upload your submission to the link provided in Google Classroom and make sure that the file successfully uploaded.

Title/Topic	Objectives	Rationale – Why?

DEADLINE: 15 MARCH 2021, 23:59PM

“PLAGIARISM IS AN ACADEMIC OFFENSE, NOT TO BE TOLERATED”

READING MATERIALS

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2. Vanderstoep, S. & Johnston, D. (2009). *Research Methods for Everyday Life: Blending Qualitative and Quantitative Approaches*, USA: Jossey-Bass. Retrieved from <https://www.pdfdrive.com/research-methods-for-everyday-life-blending-qualitative-and-quantitative-approaches-research-methods-for-the-social-sciences-d161070302.html>
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4. Johnson, R. & Christensen, L (2014). *Educational Research: Quantitative, Qualitative, and Mixed Approaches*, USA: SAGE Publications, Inc. Retrieved from <https://ismailsunny.files.wordpress.com/2017/07/educational-research-quantitat-r-robert-burke-johnson.pdf>



REFERENCES AND OTHER SUGGESTED READING MATERIALS

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- Walliman, N. (2018). *Research Methods the Basics*, Second Edition, London and New York: Routledge Taylor & Francis Group